## *ABSTRACT*

*Kubernetes containerization techniques are increasingly being applied in the Nginx web server environment. In Kubernetes, communication between containers is done using a plugin called Container Network Interface (CNI). However, CNI does not offer the best network solution for Nginx web server traffic. This study tested several CNI plugins to find out the best performance for using the Nginx web server to work optimally. The CNI plugins tested were Calico, Cilium, Flannel, and Weave Net. The test is carried out using pod to pod, pod to service, and client to service communication scenarios with Siege benchmark testing tools. The infrastructure used is Google Cloud Platform. Parameters measured are response time, transaction rate, throughput, and CPU usage. Based on the results obtained in this study, CNI Cilium excels in two communication scenarios, namely pod to pod with a transaction rate of 3912,99 trans/sec and a throughput of 2,44 Mbps and pod to service communication with a transaction rate of 3975,05 trans/sec. and a throughput of 2,48 Mbps. CNI Flannel excels in client to service communication with a transaction rate parameter of 110,02 trans/sec and a low CPU usage performance of 7,7%. Meanwhile, CNI Calico and Weave Net showed less than optimal results in the three communication scenarios.*



***Keywords:*** *Container, Kubernetes, Container Network Interface, Nginx, Virtual Machine.*